

Fluctuation Scaling Trend Regime

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Trend Following (Regime-Gated)

TIMEFRAME

H1 (1 Hour)

WEBSITE

www.algoBot.live

⚠ Important Disclaimer This document is for educational and informational purposes only. It does not constitute financial or investment advice. Trading forex, CFDs, and other leveraged instruments involves substantial risk of loss and is not suitable for all investors. Past backtest performance does not guarantee future results. Never trade with capital you cannot afford to lose.

Overview

Fluctuation Scaling Trend Regime is a regime-gated trend-following Expert Advisor whose defining idea is that it will not follow a trend until it has statistical evidence that a trend is genuinely present. That evidence comes from **Detrended Fluctuation Analysis (DFA)** — a technique borrowed from statistical physics that measures the *self-affine scaling* of a price series.

DFA distills the recent price history into a single number, the **scaling exponent alpha (α)**, which describes how the market's fluctuations grow as you look over longer and longer windows:

- **$\alpha \approx 0.5$** — the series behaves like a random walk. There is no exploitable structure, so the EA stands aside.
- **$\alpha > 0.5$** — the series is *persistent* (trending). Moves tend to be followed by moves in the same direction, so momentum tends to continue.
- **$\alpha < 0.5$** — the series is *anti-persistent* (mean-reverting). Moves tend to reverse, which is hostile to a trend follower.

Only when alpha proves the market is **persistent** (α above the configurable **TrendThreshold**) does the strategy arm itself. It then rides the direction of a fast/slow EMA drift filter and enters on a fresh close-cross of the fast EMA, protecting every trade with an ATR-based stop and target and exiting cleanly on an opposite fast-EMA cross.

The core insight: most trend systems lose money because they try to trend-follow inside choppy, mean-reverting markets. DFA acts as a *regime detector* — a gate placed in front of an otherwise conventional EMA trend engine — so the EA only takes trades when the maths says the market is actually trending.

How It Works

The EA evaluates its logic **once per completed bar** on the chart's timeframe. On each new closed bar it appends the close and the full OHLC bar to rolling buffers, then runs the following pipeline.

Step 1 — Measure the regime with DFA

From the most recent `DfaWindow` returns the EA builds the *integrated profile* (the running cumulative sum of mean-removed returns), then partitions that profile into non-overlapping boxes of several sizes (4, 8, 16, ... up to a quarter of the window). Inside every box it removes a least-squares linear trend and measures the residual fluctuation `F(n)` for each box size `n`. The slope of `log F(n)` against `log n` is the scaling exponent **alpha**.

```
alpha ~ 0.5    -> random walk      (no edge – skip)
alpha > 0.5    -> persistent/trend (momentum continues)
alpha < 0.5    -> anti-persistent  (mean reverts)
```

If there is not enough history to fit at least two box scales, DFA returns "not-a-number" and the bar is skipped entirely. The gate is simple: `persistent = alpha > TrendThreshold`.

Step 2 — Establish direction and timing

Three ordinary indicators supply drift and timing:

- **Fast EMA** (`FastEma`) and **Slow EMA** (`SlowEma`) define the *drift*: `upDrift` when fast > slow, `downDrift` when fast < slow.
- A **fresh close-cross of the fast EMA** supplies the trigger. A `bullCross` occurs when the previous close was at or below the fast EMA and the current close is above it; a `bearCross` is the mirror image.
- **ATR** (`AtrPeriod`) sizes the protective stop and target in volatility units.

Step 3 — Entry logic

A trade is only opened when *all* conditions align, and only one position per magic number may be open at a time:

- **Long:** the series is persistent *and* `upDrift` *and* a `bullCross` just printed. Buy at Ask.
- **Short:** the series is persistent *and* `downDrift` *and* a `bearCross` just printed. Sell at Bid.

Each order carries the measured alpha in its comment (e.g. `DFA a=0.61`) for easy inspection in the trade journal.

Step 4 — Stop loss & take profit

Both are anchored to the current ATR at the moment of entry:

```
Long:   SL = entry - AtrMultSl * ATR      TP = entry + AtrMultTp * ATR
Short:  SL = entry + AtrMultSl * ATR      TP = entry - AtrMultTp * ATR
```

With the defaults (`AtrMultSl = 2.0`, `AtrMultTp = 3.0`) each trade targets a 1.5 : 1 reward-to-risk ratio, scaled automatically to the instrument's current volatility.

Step 5 — Exit management

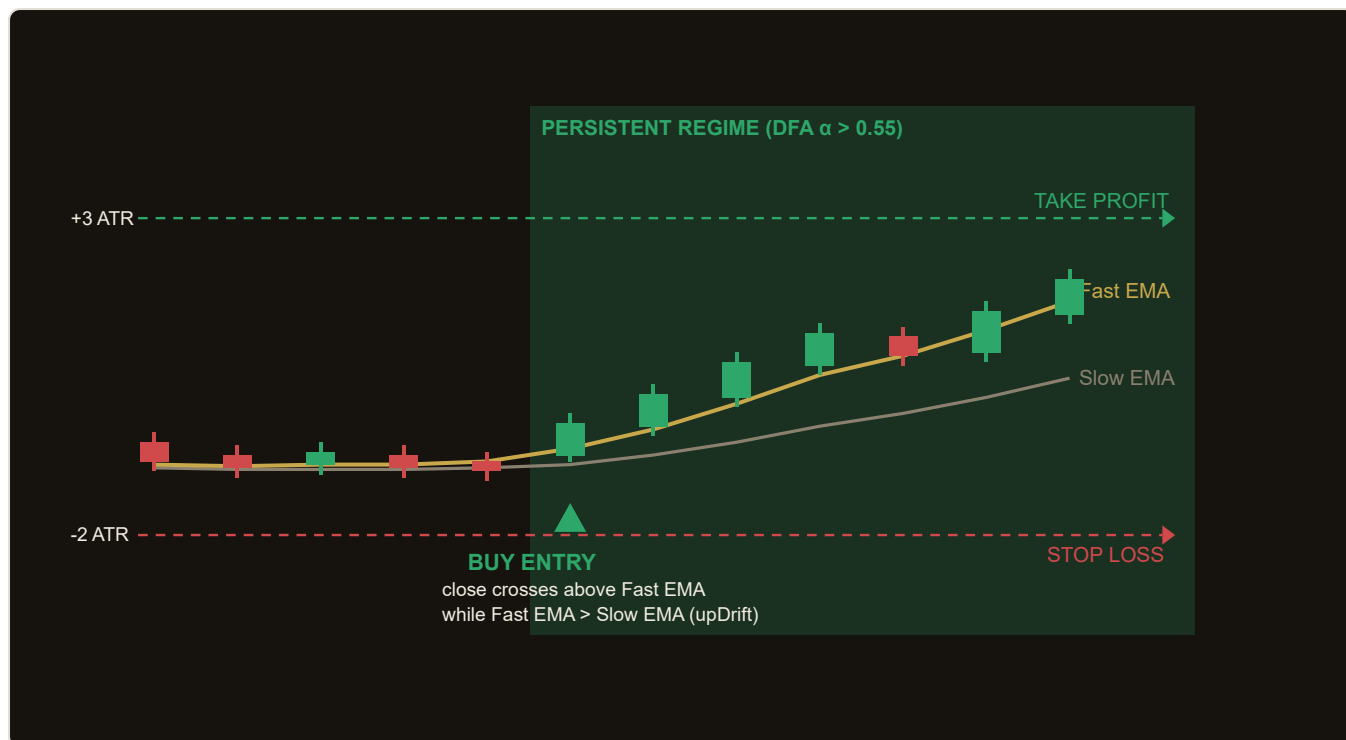
Independently of the stop and target, an open position is closed early on an **opposite fast-EMA cross**: a long is closed on a `bearCross`, a short on a `bullCross`. This lets the EA step out the moment the short-term trend structure that justified the trade breaks down, rather than waiting for the full stop distance.

Worked example (long)

Over the last 128 bars DFA reports $\alpha = 0.63$, comfortably above the 0.55 threshold — the market is persistent. The fast EMA sits above the slow EMA (upDrift), and the just-closed bar's close pushes back above the fast EMA after a shallow pullback (bullCross). The EA buys at the Ask, places the stop $2 \times \text{ATR}$ below and the target $3 \times \text{ATR}$ above, and will exit early should price later close back below the fast EMA.

Strategy in Action

The illustration below shows an example of how the strategy identifies a setup and triggers its entry and exit. This is a simplified, illustrative example for educational purposes — not real market data.



Illustrative example only. Actual market behaviour varies.

Parameters

Parameter	Default	Description
DfaWindow	128	Number of returns used in the DFA calculation. Larger windows measure longer-horizon scaling and react more slowly. Range 64–256, step 16.
TrendThreshold	0.55	Persistence gate on the scaling exponent alpha. Trades are only allowed when α exceeds this value. Higher = stricter (fewer, higher-conviction trades). Range 0.50–0.70, step 0.01.
FastEma	20	Length of the fast EMA. Supplies the entry/exit close-cross trigger. Range 5–60, step 1.
SlowEma	55	Length of the slow EMA. The fast-vs-slow relationship defines the trade direction (drift filter). Range 20–150, step 5.
AtrPeriod	14	Averaging period for the ATR that sizes the stop and target. Range 7–40, step 1.
AtrMultSl	2.0	ATR multiple for the protective stop-loss distance. Range 1.0–5.0, step 0.25.
AtrMultTp	3.0	ATR multiple for the take-profit distance. Range 1.0–8.0, step 0.25.
Lots	0.10	Fixed order volume in lots. Range 0.01–1.0, step 0.05.
Magic	1001	Magic number identifying this EA's positions so it manages only its own trades.

Reward-to-risk: the ratio of trades is set by `AtrMultTp / AtrMultSl`. The defaults (3.0 / 2.0) give a 1.5 : 1 target. Raising `AtrMultTp` aims for larger runners at the cost of a lower hit rate; lowering it books profit sooner.

Recommended Settings

The defaults are tuned for liquid FX majors on the **H1 timeframe**, where the 128-bar DFA window spans several trading days and the EMA lengths capture multi-session swings.

- **Symbols:** major FX pairs with tight spreads (e.g. EUR/USD, GBP/USD, USD/JPY) or a low-spread index/metal.
- **Timeframe:** H1 is the design point. Higher timeframes (H4) make the regime gate slower but steadier; sub-hourly charts amplify spread and noise.
- **Regime gate:** keep `TrendThreshold` at 0.55 to start. Raise toward 0.60–0.62 if you want fewer, cleaner trend entries; lower toward 0.52 for more frequent (but noisier) signals.
- **Risk:** size `Lots` conservatively relative to account equity and validate on a demo account before going live.

Tip: because the DFA window plus the slow EMA and ATR periods need warm-up history, allow the chart to load a few hundred bars before expecting the first signal. On a fresh chart the EA waits until at least `DfaWindow + 2` bars are available.

Optimisation caution: the DFA window, threshold, and EMA lengths interact. Over-fitting these to a single historical period can produce impressive backtests that fail forward. Prefer robust settings that work across several symbols and date ranges over a single "perfect" combination.

How to Install on MetaTrader 5

- 1 Copy `FluctuationScalingTrendRegime.ex5` to your MT5 `MQL5\Experts\` folder
- 2 Restart MetaTrader 5 and refresh the Navigator panel
- 3 Drag the EA onto a chart matching the recommended symbol and timeframe
- 4 Configure the input parameters and click **OK**
- 5 Enable **Algo Trading** in the MT5 toolbar

Risk Warning

Trading foreign exchange, CFDs, and other leveraged financial instruments involves substantial risk of loss and is not suitable for all investors. The strategies and tools described in this document are provided for **educational purposes only** and do not constitute financial advice, investment recommendations, or solicitation to trade. Always consult a qualified financial adviser before making trading decisions. Past backtest performance is not indicative of future results.